

WHAT IS CLAIMED IS:

1. A method for providing a wireless application protocol service for wireless Internet, in which a content server on the Internet performs data processing at a wireless datagram protocol layer, the method comprising the steps of:

- (a) at the content server, receiving a user request message for a wireless Internet service from a wireless application protocol terminal connected to a mobile communications network, the request message being based on a wireless application protocol;
- (b) at the content server, processing the request message received in the step (a) according to the wireless application protocol;
- (c) at the content server, constructing a response message in accordance with the wireless application protocol, to reply to the user request message; and
- (d) sending the response message, from the content server, to the wireless application protocol terminal;

wherein a relay, providing a communications channel between the mobile communications network and the Internet, relays the request message transmitted in the step (a) and the response message transmitted in the step (d) at a layer always below the wireless datagram protocol layer, the request message being transferred to the content server, and the response message being transferred to the wireless application protocol terminal.

2. The method of claim 1, wherein the relay intermediates between the content server and the wireless application protocol terminal, at an Internet protocol layer lower than the wireless datagram protocol layer.

3. The method of claim 1, wherein the wireless application protocol terminal is a mobile communications terminal complying with one of a code division multiple access (CDMA) mode, a global system for mobile communication (GSM) mode, and an IMT2000 mode.

4. The method of claim 1, wherein the content server provides a push service of transmitting information to the user one-way based on the wireless application protocol.

5. A method for providing a wireless application protocol service for wireless Internet, in which a relay providing a communications channel between a mobile communications network and the Internet performs data processing at a layer only below a wireless datagram protocol layer during communications between a wireless application protocol terminal connected to the mobile communications network and a content server on the Internet, and the content server on Internet performs data processing at the wireless datagram protocol layer, the method comprising the steps of:

- (a) at the wireless application protocol terminal, transmitting a request message for a wireless Internet service in accordance with a wireless communications protocol, in response to a user input;
- (b) at the relay, relaying the request message transmitted in the step (a) to the content server, the relay performing data processing of the request message at a layer only below the wireless datagram protocol layer;
- (c) at the content server, receiving the request message transferred in the step (b) and processing the request message in accordance with the wireless application protocol, the processing of the request message including processing at the wireless datagram protocol layer;
- (d) at the content server, constructing a response message in accordance with the wireless application protocol, in reply to the request message, and transmitting the response message;
- (e) at the relay, relaying the response message transmitted in the step (d) at the layer only below the wireless datagram protocol layer so as to transfer the response message to the wireless application protocol terminal; and
- (f) at the wireless application protocol terminal, outputting the contents of the response message transferred in the step (e).

6. A method for providing a wireless application protocol service for wireless Internet, in which a wireless application protocol server on the Internet performs data processing at a wireless datagram protocol layer, the method comprising the steps of:

- (a) at the wireless application protocol server, receiving a user request message for a wireless Internet service from a wireless application protocol terminal connected to a mobile communications network, the request message being based on a wireless application protocol;
- (b) converting the request message received in the step (a) into a web service request message used over the Internet;
- (c) transmitting the web service request message to a web server on the Internet and receiving a web service response message corresponding to the request message;
- (d) converting the web service response message received in the step (c) into a response message based on the wireless application protocol; and
- (e) transmitting the response message based on the wireless application protocol to the wireless application protocol terminal,

wherein a relay providing a communication channel between the mobile communication network and the Internet relays the request message transmitted in the step (a) and the response message transmitted in the step (e), said relaying being performed with data processing of said messages at a layer only below the wireless datagram protocol layer, the request message being transferred to the wireless application protocol server, and the response message being transferred to the wireless application protocol terminal.

7. The method of claim 6, wherein in the steps (b) and (d), protocol conversion is performed between a communications protocol for the wireless Internet service and a communications protocol for a web service through the Internet.

8. The method of claim 6, wherein in the step (d), protocol conversion is performed between a communications protocol for the wireless Internet service and a communications protocol for a web service through the Internet, and wherein document format conversion is

performed between a document format for the wireless Internet service and a document format for a web service through the Internet.

9. The method of claim 6, wherein the relay intermediates between the wireless application protocol server and the wireless application protocol terminal, at an Internet protocol layer below the wireless datagram protocol layer.

10. The method of claim 6, wherein the wireless application protocol terminal is a mobile communications terminal complying with one of a code division multiple access (CDMA) mode, a global system for mobile communication (GSM) mode, and an IMT2000 mode.

11. A method for providing a wireless application protocol service for wireless Internet, in which a relay, providing a communications channel between a mobile communications network and the Internet, performs data processing at a layer only below a wireless datagram protocol layer during communications between a wireless application protocol terminal connected to the mobile communications network and a wireless application protocol server on the Internet, the wireless application protocol server on the Internet performing data processing at the wireless datagram protocol layer, said method comprising:

(a) at the wireless application protocol terminal, transmitting a request message for a wireless Internet service according to a wireless communications protocol, in response to an input by a user;

(b) at the relay, relaying the request message transmitted in the step (a) at the layer below the wireless datagram protocol layer so that the request message is transferred to the wireless application protocol server;

(c) at the wireless application protocol server, receiving and converting the request message transferred in the step (b) into a web service request message according to a protocol used over the Internet;

(d) transmitting the web service request message to a web server on the Internet and receiving a web service response message corresponding to the request message;

- (e) at the wireless application protocol server, converting the web service response message received in the step (d) into a response message based on the wireless application protocol and transmitting it to the wireless application protocol terminal;
- (f) at the relay, relaying the response message transmitted in the step (e) at the layer below the wireless datagram protocol layer to transfer the response message to the wireless application protocol terminal; and
- (g) at the wireless application protocol terminal, outputting the contents of the response message transmitted in the step (f).

12. A method for providing a wireless application protocol service for wireless Internet, in which a content server providing a web service on the Internet performs data processing at a wireless datagram protocol layer , the method comprising the steps of:

- (a) at the content server, receiving a user request message for a wireless Internet service from a wireless application protocol terminal connected to a mobile communications network, the request message being based on a wireless application protocol;
- (b) at the content server, converting a document format for the web service through the Internet into a document format for the wireless Internet service in order to provide a response to the user request message;
- (c) constructing a response message based on the wireless application protocol, using the response, converted into the document format for the wireless Internet service in the step (b); and
- (d) transmitting the converted response to the wireless application protocol terminal; wherein a relay providing a communications channel between the mobile communications network and the Internet relays the request message transmitted in the step (a) and the response message transmitted in the step (d) at a layer only below the wireless datagram protocol layer such that the request message is transferred to the content server, and the response message is transferred to the wireless application protocol terminal.

13. The method of claim 12, wherein the relay intermediates between the content server and the wireless application protocol terminal, at an Internet protocol layer.

14. The method of claim 12, wherein the wireless application protocol terminal is a mobile communications terminal complying with one of a code division multiple access (CDMA) mode, a global system for mobile communication (GSM) mode, and an IMT2000 mode.

15. The method of claim 12, wherein the wireless application protocol service provided by the content server together with the web service through the Internet is supported by a software module installed separately from a software module for the web service.

16. A method for providing a wireless application protocol service for wireless Internet, in which a relay providing a communications channel between a mobile communications network and the Internet only performs data processing at a layer only below a wireless datagram protocol layer during communications between a wireless application protocol terminal connected to the mobile communications network and a content server providing a web service through the Internet, and the content server on the Internet performs data processing at the wireless datagram protocol layer, the method comprising the steps of:

- (a) at the wireless application protocol terminal, constructing and transmitting a request message for a wireless Internet service based on a wireless communications protocol, in response to an input by a user;
- (b) at the relay, relaying the request message transmitted in the step (a) at the layer only below the wireless datagram protocol layer so that the request message is transferred to the content server;
- (c) at the content server, receiving the request message transferred in the step (b);
- (d) at the content server, converting a document format for the web service through the Internet into a document format for the wireless Internet service in order to provide a response to the user request message;
- (e) constructing a response message based on the wireless application protocol, using the response converted into the document format for the wireless Internet service in the step (d), and transmitting the constructed response message;

- (f) at the relay, relaying the response message transmitted in the step (e) at the layer only below the wireless datagram protocol layer so that the response message is transferred to the wireless application protocol terminal; and
- (g) at the wireless application protocol terminal, outputting the contents of the response message transmitted in the step (f).

25 17. A system for providing a wireless application protocol service, the system comprising:

a service terminal supporting a wireless application protocol, and connected to a mobile communications network;

5 a relay providing a communications channel between the mobile communications network and the Internet; and

a content server for providing a content service for wireless Internet, the content server being connected to the Internet,

wherein the relay intermediatelys between the service terminal and the content server only at one or more layers below a wireless datagram protocol layer, and the content server performs data processing including the wireless datagram protocol layer, thereby 10 providing the wireless application protocol service for the service terminal.

18. A system for providing a wireless application protocol service, the system comprising:

a service terminal supporting a wireless application protocol and connected to a mobile communications network;

5 a relay providing a communications channel between the mobile communications network and the Internet;

a content server providing content through a web service over the Internet, the content server being connected to the Internet; and

10 a wireless application protocol server intermediatelys between the service terminal and the content server, the wireless application protocol server being connected to the Internet, wherein:

the relay intermediates between the service terminal and the wireless application protocol server only at one or more layers below a wireless datagram protocol layer,

15 the wireless application protocol server performs data processing including the wireless datagram protocol layer or higher layers,

the wireless application protocol server converts a service request into a web service request used over the Internet and transmits the service request to the content server when receiving the service request based on a wireless application protocol from the service terminal via the relay, and

20 the wireless application protocol server converts a web service response into a response based on the wireless application protocol, and transmits the converted response to the service terminal via the relay when receiving the web service response from the content server.

19. A system for providing a wireless application protocol service, the system comprising:

a service terminal supporting a wireless application protocol and connected to a mobile communications network;

5 a relay providing a communications channel between the mobile communications network and the Internet; and

a content server providing content through a web service over the Internet and providing a content service for wireless Internet, the content server being connected to the Internet, wherein:

10 the relay intermediates between the service terminal and the content server at a layer only below a wireless datagram protocol layer,

the content server performs data processing at the wireless datagram protocol layer or higher layers, and

15 the content server has a function of converting a document format for the web service into a document format for a wireless Internet service in order to provide the wireless application protocol service for the wireless Internet to the service terminal.